

Appl. No. 10/047,280
Reply to Office Action of 09/30/2003

REMARKS

This amendment is responsive to the Office Action dated September 30, 2003. Applicants have amended claims 3-4, 7, 28-29, and 31, and cancelled claims 20-25. Claims 1-19 and 26-37 are pending.

Claim Objections

The Examiner objected to claims 17, 35 because of certain "informalities." In particular, the Examiner asserted that it was unclear what Applicant intends to claim with the language "wherein the tape drive emulator comprises ... one or more mounting holes." For clarification, the Applicant refers the Examiner to page 6, lines 4-10, of the present specification. In this passage, the Applicant describes a tape drive emulator that includes appropriately located power connectors, mounting holes and electrical sockets for use with conventional backup infrastructure, such as library system.

Claim Rejection Under 35 U.S.C. § 112

In the Office Action, the Examiner rejected claims 3-4, 7-9, 22-23, 28-29, and 31 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants have amended claims 3-4, 7, 22, 28, 29, and 31 for purposes of clarification. Applicants submit that claims, as amended, particularly point out and distinctly claim the subject matter, as required by 35 U.S.C. 112, second paragraph. Applicant thanks the Examiner for identifying these errors.

Allowable Subject Matter

Original claims 3-4 and 28-29 are dependent claims that would be allowable but for the rejections under 35 U.S.C. 112, second paragraph, addressed above by the Applicant. Applicant has rewritten claims 3-4 and 28-29 in independent form, and respectfully requests prompt allowance of these claims.

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Claim Rejection Under 35 U.S.C. § 103

Claims 1-2, 5-13, 16-19, 26-27, and 30-37

In the Office Action, the Examiner rejected claims 1-2, 5-13, 16-19, 26-27, and 30-37 under 35 U.S.C. 103(a) as being unpatentable over Plotkin et al. (U.S. 5,297,124). Applicants respectfully traverse the rejection. The applied references fail to disclose or suggest the inventions defined by Applicants' claims, and provide no teaching that would have suggested the desirability of modification to arrive at the claimed invention.

With reference to independent claim 1, for example, the applied references lack any teaching that would have suggested the system that combines a data cartridge carrying a non-tape storage medium, wherein the data cartridge includes read/write circuitry to access the non-tape storage medium and an external electrical connector coupled to the read/write circuitry, and a tape drive emulator having an electrical socket to receive the electrical connector of the data cartridge.

With respect to claim 1, the Examiner relies solely on Plotkin et al. ("Plotkin"). In particular, the Examiner states that Plotkin teaches all elements of Applicants' claim 1, except the tape drive emulator having an electrical socket to receive the electrical connector of the data cartridge. Applicant respectfully submits that the Examiner has misinterpreted the scope and content of Plotkin.

For example, Plotkin fails to describe or even mention a data cartridge carrying a non-tape storage medium, as required by Applicants' claim 1. As well known in the art, and as used in the present application as well as the cited references, the term "cartridge" refers to a removable storage device that typically includes magnetic tape for storing data. A wide variety of industry standard tape data cartridges exist. Moreover, an enormous amount of automated storage libraries and infrastructure, e.g., robotic arms and other automation units, exist for physically manipulating these industry-standard data cartridges. A typical automated storage library includes an automation unit, a library of tape-based data cartridges, and an array of tape drives to receive the cartridges via the automation unit.

In contrast to the requirements of claim 1, Plotkin describes "an emulator system which allows a disk drive to transparently emulate a tape drive." More specifically, Plotkin describes an

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emulation system that is coupled to a host computer, and that utilizes a conventional disk drive.¹ In fact, the emulator 16 described by Plotkin includes the disk drive 18 embedded therein.² In other words, the Plotkin emulator is a device that plugs into a host computer and emulates a tape drive by translating tape commands and storing data on the emulator's internal hard drive.

Consequently, Plotkin fails to describe or suggest a data cartridge carrying a non-tape storage medium, as required by claim 1. Accordingly, Plotkin also fails to describe or suggest a data cartridge having read/write circuitry to access the non-tape storage medium and an external electrical connector coupled to the read/write circuitry. In addition, Plotkin fails to describe a tape drive emulator having an electrical socket to receive the electrical connector of the data cartridge. As Plotkin only describes an emulator for use with a standard, internal hard drive, Plotkin fails to describe an emulator capable of receiving a removable storage device, let alone an emulator capable of receiving a data cartridge having a non-tape storage medium.

The Examiner cites no other reference to address these deficiencies, but asserts that it would have been obvious to one of ordinary skill in the art to use an electrical socket in the tape drive emulator to receive the electrical connector of the data cartridge. First, this statement overlooks the deficiencies of Plotkin described in the preceding paragraphs, such as the fact that Plotkin fails to describe or suggest a data cartridge carrying a non-tape storage medium, and an emulator capable of receiving a data cartridge having a non-tape storage medium. Secondly, the Plotkin emulator describes the use of an internal hard drive. Incorporation of an electrical socket within the Plotkin emulator to receive an electrical connector of a data cartridge, as required by Applicant's claim 1, would have been nonsensical, let alone obvious to one of ordinary skill in the art.

With respect to claim 2, the Examiner cites no additional references, yet asserts that a tape drive emulator having a zero insertion force (ZIF) socket having a set of connectors that receive and engage the electrical connections of the data cartridge would have been obvious to one skilled in the art in view of the Plotkin emulator. As described in the present application, the external electrical connector of the data cartridge and the socket of the tape drive emulator provide a robust electrical connection between the tape drive emulator and the data cartridge. The use of a

¹ See Summary of The Invention, Col. 2, ll. 20-34.

² See, e.g., Figure 1 and col. 3, ll. 4-25.

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Zero Insertion Force (ZIF) socket may allow an automation unit to easily insert and remove the data cartridge from the tape drive emulator. Accordingly, data cartridges having non-tape storage media may be used within a library automation system with little or no change to the automation unit or the host computing device.

Plotkin describes a tape emulator for coupling a host computer to a standard disk drive embedded within the emulator. Applicants submit that it would not have been obvious to one skilled in the art to incorporate a ZIF socket within the Plotkin emulator as the emulator has an internal, non-removable hard drive. Moreover, a person with skill in the art reading Plotkin would have had no motivation to do so because, as indicated above, the Plotkin emulator describes an internal hard drive for which use of a ZIF socket would be of no value.

With respect to claim 13, Plotkin fails to teach or suggest the socket of the tape drive emulator providing power to the controller of the data cartridge via the electrical connector of the data cartridge. Moreover, the Examiner fails to cite any reference that teaches or suggests these elements. Instead, the Examiner concludes that it would be obvious without providing evidentiary support. Applicants submit that providing power to a data cartridge via an electrical connector of a tape-drive emulator would not have been obvious. Conventional tape-based data cartridges include reels or spindles that are mechanically driven by tape drives. No evidence has been introduced in the record to establish that an emulator having a socket to receive an electrical interface of a data cartridge, and provide power to the internal read/write circuitry of the data cartridge, would have been obvious to one of ordinary skill in the art. Accordingly, the Examiner has clearly failed to even establish a *prima facie* case of obviousness with respect to claim 13.

With respect to claim 16, the Examiner asserts that Plotkin teaches a "plug-compatible emulator system, ... hence the tape drive emulator having a form factor of an industry standard tape drive such that the location of the socket conforms to the location of a slot within the industry standard tape drive." However, Plotkin describes a "plug-compatible" system that is compatible with a tape interface of a host computer, i.e., the electrical interface presented by the host computer. However, Plotkin makes no mention that the tape drive has a form factor of an industry standard tape drive. In fact, there is no discussion in Plotkin of the form factor of the Plotkin emulator whatsoever, let alone that the emulator has a form factor that conforms to an industry standard for a tape drive. As described in the present application, conformance to an

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industry standard for a tape drive allows the presently described tape drive emulator to be used with the many existing tape-based cartridge libraries and automation units.

In addition, Plotkin fails to describe a tape emulator in which the location of the socket that receives the data cartridge conforms to the location of a slot within the industry standard tape drive, as required by claim 16. As explained above, Plotkin fails to describe an emulator that receives any type of removable data cartridge, let alone a tape emulator having a socket that conforms to a location of a slot within an industry standard tape drive. In other words, the socket of the present tape emulator is positioned to conform to a location at which a conventional (i.e., non-emulation) tape drive would otherwise have a slot to receive the data cartridge. To the extent that the Plotkin emulator is "plug-compatible," this refers to the interface between the Plotkin emulator and the host computer, not the interface between the tape emulator and removable cartridges.

Similarly, with respect to claim 17, Plotkin makes no mention of the physical form factor of the Plotkin emulator whatsoever with respect to an industry standard tape drive. Plotkin only refers to the electrical interface between the Plotkin emulator and the host computer as being "plug-compatible." Consequently, Plotkin fails to teach or suggest a tape drive emulator having a power connector and one or mounting holes, and further wherein the dimensions of the tape drive emulator, the location of the power connector, and the location of the mounting holes conform to the industry standard tape drive. As described in the present application, conformance to a form factor of an industry standard tape-based drive may allow the present emulator and non-tape data cartridge to be physically configured for use with the existing backup infrastructure.

With respect to independent claim 26, Plotkin fails to teach or suggest a tape drive emulator comprising an electrical socket to receive an electrical connector of a data cartridge carrying a non-tape storage medium. As described above, Plotkin describes a tape emulator that plugs into a host computer and emulates a tape drive by translating tape commands and storing data on the emulator's internal hard drive. Plotkin fails to describe an emulator capable of receiving any form of removable storage device, let alone an emulator capable of receiving a data cartridge having a non-tape storage medium.

Dependent claims 5-12, 18-19, 27, and 30-37 are patentable for at least the reasons set forth above.

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Claims 14-15

In the Office Action, the Examiner rejected claims 14-15 under 35 U.S.C. 103(a) as being unpatentable over Albrecht et al. (Pub. No. 2002/0159182 A1) in view of Plotkin et al. (U.S. 5,297,124). Applicant respectfully traverses the rejection.

With respect to claim 14, the Examiner asserts that Albrecht et al. ("Albrecht") teaches the claimed invention except for a tape drive emulator having an electrical socket to receive the electrical connector of the data cartridge. The Examiner then asserts that Polkin teaches a tape drive emulator having an electrical socket to receive the electrical connector of the data cartridge, and that it would have been obvious to one skilled in the art to use the Albrecht's data cartridge in conjunction with the Polkin tape drive emulator.

However, as discussed above in detail, Plotkin describes a tape emulator that translates tape commands and stores data on the emulator's internal hard drive. In contrast to the Examiner's assertions, Plotkin fails to describe an emulator capable of receiving any form of removable storage device, let alone a tape drive emulator comprising an electrical socket to receive a data cartridge having a non-tape storage medium. Consequently, modification of the Plotkin system to utilize the data cartridge of Albrecht would not have been obvious to one skilled in the art at the time of the present invention. In fact, the Plotkin emulator is not capable of receiving any form of a data cartridge, and there is no suggestion for such capability.

Similarly, as admitted by the Examiner, Albrecht makes no mention of a tape drive emulator having an electrical socket for receiving a data cartridge. In fact, Albrecht contains no teaching or suggestion of the use of a tape drive emulator whatsoever. In contrast, Albrecht merely describes a transfer station 100 for providing data transfer to a portable data storage cartridge³, but fails to teach or suggest a tape emulator that translates sequential access commands (e.g., tape commands) from a host interface to block commands for application to a disk drive within the portable data cartridge. Thus, none of the reference of record, either singularly or in combination, teaches or suggests the combination of a data cartridge carrying a non-tape storage medium, wherein the data cartridge includes read/write circuitry to access the non-tape storage medium and an external electrical connector coupled to the read/write circuitry,

³ See, e.g., col. 5, paragraphs 68-70.

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and a tape drive emulator having an electrical socket to receive the electrical connector of the data cartridge.

Claims 20-25

Applicant has cancelled claims 20-25 without prejudice.

For at least these reasons set forth above, the Examiner has failed to establish a prima facie case for non-patentability of Applicant's claims 1-2, 5-19, 26-27 and 30-37 under 35 U.S.C. 103(a). Withdrawal of this rejection is requested.

CONCLUSION

All claims in this application are in condition for allowance. Applicants respectfully request reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 09-0069. The Examiner is invited to telephone the below-signed attorney to discuss this application.

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12/23/03

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